

## ABSTRACT

An electrically alterable, non-volatile memory cell has more than two memory states that can be programmed selectively. Programming of the cell can be performed without actually reading the memory state of the cell during the programming operation. A plurality of the memory cells are preferably arranged in a matrix of rows and columns disposed substantially in a rectangle, with a plurality of word lines coupled with memory gate electrodes intersecting a first side of the rectangle substantially perpendicularly, a plurality of bit lines coupled with memory drain-source current paths intersecting a second side of the rectangle substantially perpendicularly (the second side also substantially perpendicularly intersecting the first side), a row select circuit being disposed at the first side for coupling with the word lines, and peripheral circuitry including a column select circuit and a sense circuit being disposed at the second side.